Responsiveness Summary
Determination of Treatment and Source Control for UIC Wells in Washington State
July 6 – September 15, 2005

As part of the UIC rule revision process, draft technical guidance was included on using UIC wells to manage stormwater. This draft technical guidance originated from interim guidance developed as part of the Stormwater Management Manual for Eastern Washington (SMMEW). The interim guidance was revised to include statewide issues and was included as part of the public review of the UIC Rule that occurred July 6 – September 15, 2005.

Stakeholder meetings will be held during Spring 2006 to continue discussions on finalizing the draft guidance, based on comments received. Prior to the stakeholder meetings, Ecology will revise the draft guidance based on non-controversial comments that were received on improving the guidance. The revised draft guidance, along with the comments received by September 15, 2005, will be the basis for continued discussions.

To participate in these discussions, please contact:

Mary Shaleen-Hansen
Water Quality Program
Department of Ecology
P.O. Box 47600
Olympia, WA 47600-7600
Phone: 360.407.6143
FAX: 360.407.6426
Email: maha461@ecy.wa.gov

Once finalized, the technical guidance will be used statewide and published independently as guidance to the UIC Rule implementation.

The following response to comments addresses comments received during the public review process.

Section I - Overall Comments
The technical guidance provided in the document is generally sound and will help avoid the most acute potential water-quality impacts from underground injection of storm water. (USGS) ***RESPONSE: Thank you for the comment.***
Overall the guidance is a good document that provides the details that the rule omits. (Thurston County, Bachmeier) ***RESPONSE: Thank you for the comment.***
The Yakima area receives between six to eight inches of precipitation annually, and much of this precipitation falls in the form of snow between November and March. Yakima rarely experiences rainfall events with durations lasting between two to three days (regional storms as defined in Chapter 4 of the SMMEW). As a result, infiltration drywells are use extensively in the urban areas of Yakima since the construction of more elaborate stormwater facilities is not practical, nor economical. (Yakima County)

RESPONSE: Ecology has taken note of this comment.

The City of Richland believes the Draft UIC Guidance is difficult to read and does not make the use of best science available. (City of Richland/Yakima County)

RESPONSE: Ecology would like the guidance to be as easy to read as we can make it. We appreciate suggestions that help us make this a more readable document. Ecology also appreciates comments on best available science. We need specifics to be able to respond to this concern. The department plans to hold further stakeholder meetings to address issues raised by comments on the draft guidance. We hope you will participate in these meetings.

The Draft UIC Guidance document has significantly changed from the interim guidance inserted in Chapter 5.6 of the Stormwater Management Manual for the Eastern Washington (SMMEW) as published in 2004. A UIC sub-committee of the Eastern Washington Stormwater Steering Committee, which included stakeholders representing all parties including regulators, developers, citizens, local government and environmental group developed the current interim guidance in the SMMEW. (City of Richland/Yakima County)

RESPONSE: Ecology revised the guidance to address outstanding issues. We also edited the guidance to make it more reader friendly. Ecology is planning on holding a stakeholders meeting to work through the issues that were received as formal comments during the UIC rule formal comment period.

Definition of Ground Water

I understand from the discussion at the workshop that EPA has a definition of ground water for UIC as the source of water for domestic drinking. If this is what is being required by EPA, why does DOE define ground water as all waters beneath the land? What is the science basis for the difference in DOE and EPA definition? It seems like we could have perched small lenses of ground water that are not a threat to public health. (Thurston County, Rancour)

RESPONSE: The federal UIC regulation protects drinking water sources. State rules must be as stringent as federal rules but they do not have to be identical. Washington chose to protect all ground water as water of the state in RCW 90.48 and this requirement is captured under chapter 173-200 WAC Water Quality Standards for ground water in Washington. The UIC rule must protect all ground water.

Phase II stormwater permit and UIC rules

In Thurston County, our geology and soils promote infiltration in many geographical areas of the NPDES Phase II areas. As we currently understand, all of our infiltration UICs (assuming the non-endangerment standard and be registered) will be regulated under the proposed Draft Underground Injection Control Program, Chapter 173-218 WAC and the Draft Determination of Treatment and Source Control for UIC Wells in Washington State (July 2005), and not the NPDES Phase II permit. However, the latest information on the UIC rules includes the proposal to include UIC wells in a State Waste Discharge Permit (Aug 16, 2005 workshop in Longview), and the Stormwater Management Manual for Eastern Washington (1-13, line 7) states that "Jurisdictions applying for coverage under the Phase II Municipal Stormwater NPDES Permit

will receive a combined NPDES State Waste Discharge Permit." Please provide clarification of the relationship between NPDES Phase I and II and the UIC rules under revision. (Thurston County, Bachmeier)

RESPONSE: You are correct – UIC wells will be regulated under Chapter 173-218 WAC and not under the NPDES permit. Since the Chapter 173-216 WAC State Waste Discharge Program was being revised along with the UIC rule, we informed the public of the revision to 173-216 at the workshops. The revision to 173-216 allows UIC wells to be under a permit. The Phase I and Phase II NPDES permits are a combined NPDES and State Waste Discharge permit. The discharges to ground that will be covered under the permits do not discharge to UIC wells, but to basins or other infiltrative structures that do not meet the UIC well definition.

Cost of Pretreatment Prohibitive

The draft UIC guidance is very restrictive and may require jurisdictions to include stormwater runoff pre-treatment in the design and construction of all new UIC facilities. This will be cost prohibitive and will force many jurisdictions in eastern Washington to avoid the use of UIC wells (in particular infiltration drywells) for stormwater management. (City of Richland/Yakima County)

RESPONSE: Pretreatment is not required for all new UIC facilities. The guidance describes the conditions for pollutant loading that call for pretreatment. We would be happy to discuss this further in our planned stakeholder meetings.

If the intent of Ecology is to ban the use of UIC wells for the purposes of stormwater management, then this should be clearly stated in the guidance document. (City of Richland)

RESPONSE: Ecology does not intend to ban the use of UIC wells for the purposes of stormwater management.

Timing of Guidance Publication

We request the schedule to revise the UIC Rule revision and issuance of the Guidance Document be pushed back to allow the Guidance Document and the Phase II Permit to be issued at the same time. (City of Richland)

It is essential that the Determination of Treatment and Source Control for UIC Wells in Washington State [Publication Number 05-10-067] be finalized and published by the effective date of the Revisions to Chapter 173-218 WAC UIC Program. Further, the interim guidance in the Stormwater Management Manual for Eastern Washington that is to be replaced and the other information on UIC wells that will remain in the Manual should be clearly stated and published by the effective date of the Revisions to Chapter 173-218 WAC UIC Program. (Central Washington Home Builder's Association)

My name is Don Phelps, and I own a vehicle recycling firm here in Washington State. In addition, the Department states that it will be providing guidance in doing a well assessment after this regulation is adopted. That simply is not acceptable. Would any of you go and buy a car without ever seeing the car, sign all of the papers, obligate to the purchase of the car, and

after signing all the papers, go see what kind car it is and find out how much you paid for the car? Certainly not, but that is what you are asking us to do with this proposed rule. Agree? We will have to do a well assessment, but not provide us the information we need to understand what is involved, or how much it will cost. Even worse, we may find out after we complete the well assessment, that we can no longer operate a UIC as provided and proposed WAC 173-128-070. If that were to happen, we are out of business. (Phelps)

RESPONSE: While we understand the desire to have technical guidance for UIC wells available in final form when the final UIC Rule is adopted, Ecology believes that the rule needs to be adopted before the technical guidance can be finalized, in order to determine what needs to appear in the final guidance. We do anticipate having follow up meetings with interested stakeholders to discuss finalizing the guidance and will be sure to include you in those meetings. We also received numerous comments on the draft guidance during the public review, and those will be valuable in considering as we work with stakeholders to finalize the document.

Timing of Publication – Best Management Practices in Rule

The UIC program should not be revised until or at the same time as the Draft Determination of Treatment and Source Control for UIC Wells in Washington State is complete. I may have additional concerns on the program based on the well assessment criteria contained in this draft and/or subsequent changes. Section 218-080 requires wells to be operated by technical manuals approved by the state. Are these the Draft Determination of Treatment and Source Control for UIC Wells in Washington State, July 2005 handed out at the meeting? This language seems like you can change the best management practices any time you want to. The best management practices should be part of the WAC. (Thurston County, Rancour)

RESPONSE: As you are probably aware, emerging treatment technologies for stormwater are continually being developed. Ecology recognizes this and discusses emerging technologies in the Stormwater Management Manual for Eastern and Western Washington. Regulations are seldom updated and with the potential for emerging technologies to be developed it was decided to leave the best management details in guidance instead of in a regulation. The regulation holds the framework for requiring best management practices either through the presumptive or demonstrative approach and the details were written in guidance knowing they could potentially be updated in the future similar to Ecology's stormwater manuals.

UIC Guidance for Eastern Washington

The Draft UIC Guidance document fails to consider the differences in climate and soil conditions that exist between the east and west side of the state. Thus, the requirements in this proposed statewide document might not be applicable to both sides of the state. (City of Richland/Yakima County)

RESPONSE: Ecology understands the concerns about regional issues. The guidance document includes ways of addressing regional differences. This may be discussed further at the stakeholders meetings that will be scheduled after the UIC rule is finalized.

We request that in the time allowed there be a separate UIC Guidance Document developed for

eastern Washington. (City of Richland)

RESPONSE: Ecology is not planning on developing a separate document for Eastern Washington because the technical guidance originated from the Stormwater Management Manual for Eastern Washington and the guidance incorporates ways of addressing regional differences.

The City of Richland, along with the other nine members of the Ten Cities Group, successfully lobbied Ecology in 2001 to develop a separate Eastern Washington Stormwater Manual. Their lobby efforts were based on the significant climatic and soil differences between eastern and western Washington. A separate Stormwater Manual and Model Program were developed with Ecology funding the projects. Ecology also chose to develop a separate NPDES Phase II permit for eastern Washington because of those differences. The Phase II permit is not scheduled to be issued until June 2006. The language in the Draft UIC Guidance document, the Phase II permit and the Eastern Washington Stormwater Manual should compliment each other and not create conflicts. (City of Richland)

RESPONSE: Ecology agrees that the regulatory documents should compliment each other. Ecology plans on holding stakeholders meetings to work on the outstanding issues on the guidance and the conflicts mentioned in the comment can be part of the discussion.

UIC Technical Guidance Subcommittee

This section makes reference to a sub-committee of the UIC rule Advisory Committee that was formed to develop the Draft UIC Guidance document. The City of Richland knows of several active members of the UIC Rule Advisory Committee who were and are, at present, unaware of any sub-committee or its membership. Therefore, eastern Washington members of the UIC Rule Advisory Committee did not have the opportunity to develop, review, or provide preliminary comments to the current Draft UIC Guidance document. (City of Richland/Yakima County)

RESPONSE: The interim guidance was incorrect in stating the subcommittee was formed from the UIC rule advisory committee. A sub-committee from the Eastern Washington Stormwater Steering Committee produced the initial drafts of the guidance. It was further developed by a subcommittee during the UIC rule revision process and the same participants continued to participate in the Eastern WA stormwater manual process. Representatives from the City of Yakima and Kennewick and Spokane County participated in the UIC rule revision process and also in developing the technical guidance. The draft guidance was also reviewed by the E WA stormwater manual committee at their meetings in Moses Lake.

Uncertainty of Vadose Zone Treatment Effectiveness

The stated preference for source control and pre-treatment cannot be over-emphasized because the short- and long-term effectiveness of “vadose zone treatment” is highly uncertain. The potential contaminants of concern have a wide range of fate and transport characteristics, and the vadose zone hydraulic characteristics are inherently heterogeneous and difficult to determine. The presumptive approach for evaluating effectiveness of vadose zone treatment is

particularly problematic. Even if the presumed initial treatment capacities shown in table 1 are correct, the capacities will be reduced and treatment will be less effective over time as pore spaces are clogged and sorption sites are filled. There is not a monitoring component for ground water in the guidelines, so changes in the effectiveness of vadose zone treatment could only be inferred if the hydraulic efficiency of a UIC well is degraded. (USGS)

RESPONSE: Ecology appreciates your comment and recognizes that there are limitations to "vadose zone treatment." This is why use of the vadose zone alone for treatment is limited to solids, metals, and oils where the pollution potential is low and the vadose zone materials are conducive to some sort of adsorption. Ecology will address this issue during the stakeholder meetings and may consider adding language to emphasize the limitations of "vadose zone treatment."

Section II – Draft Guidance Issues

Chapter 1 – Introduction - Infiltration Trenches with Perforated Pipes

Much of the guidance seems to be directed at new drywells. It is a burden to expect that small systems like infiltration trenches with perforated pipes would need the level of design described in the guidelines including items such as determining the water table depth. (King County Water and Land Resources Division)

RESPONSE: On page 2 of the July 2005 draft, it states that if an infiltration trench is designed, constructed operated and maintained according to the specifications of Ecology's stormwater management manuals they do not have to meet the criteria of the UIC guidance.

Chapter 1 – Prohibition of Stormwater Discharge to UIC Wells at Recycling Facilities

Recycling facilities (unless limited to glass products) are listed as a type of facility/area not allowed to discharge stormwater to UIC wells. It is not apparent why recycling facilities, which handle plastics, paper, and/or cardboard, would pose a threat to groundwater and would be prohibited from discharging stormwater runoff to a UIC facility. Please cite specific studies that present runoff quality data from these types of facilities. (City of Richland/Yakima County)

RESPONSE: Ecology will be addressing this and other issues that have been brought to our attention during the comment period by holding further stakeholder meetings to work through issues that are still outstanding on the guidance document. This will occur after the UIC Rule is adopted.

When to Register

Page 4, "Registration", second sentence. Although it would be desirable to ". . . submit the completed paperwork prior to first use of the UIC facility", the registration process should provide public agencies the added flexibility to batch register on an annual basis for new Class V wells meeting the nonendangerment standard via the UIC Rule's presumptive approach. (WA State Department of Transportation)

RESPONSE: The UIC proposed rule revision requires that Class V UIC wells be registered to operate. There is no regulatory mechanism in the proposed rule revision to allow for batch registration of new UIC wells on an annual basis. See WAC 173-218-060 -- Requirements to operate a UIC well. Ecology will work with municipalities and WSDOT in the registration process.

This paragraph currently reads "The project proponent should begin the registration process during the design phase and …". Suggest changing to read "… during the application of building permits and …". Many projects never make it beyond the conceptual design phase or are put on hold for various reasons (e.g., permits, land acquisition, costs, and other delays). It would make more sense to have folks begin the registration process once project proponents seek an actual building permit from their local jurisdiction. (City of Richland/Yakima County)

RESPONSE: The UIC proposed rule revision only requires the registration to be submitted prior to operation. See WAC 173-218-060 -- Requirements to operate a UIC well. Ecology will consider adding language in the technical guidance document to further clarify registration requirements.

Chapter 3 - Setbacks and Siting

What is the impact of setbacks on existing UIC wells ? (King County Water and Land Resources Division)

RESPONSE: The setback and siting requirements of the UIC technical guidance apply to new UIC wells.

Page 7, "Setbacks", forth bullet. The statements: "Additional setbacks must be considered if roadway de-icers or herbicides are likely to be present in the influent to the infiltration system" is ambiguous and begs more detail. How are additional setbacks considered? Additional setbacks from what? (WA State Department of Transportation)

RESPONSE: Ecology agrees that this item needs better consideration and more detail. Ecology will be addressing this and other issues that have been brought to our attention during the comment period. After the UIC rule is finalized, we will hold further stakeholder meetings to work through issues that are still outstanding on the guidance document.

Page 7 Chapter 3 of Determination of Treatment and Source Control for UIC Wells in Washington State seventh bullet under Setbacks, conflicts with DOE's SWM for WW, which requires a minimum setback of 50 feet. (Kitsap County Public Works)

RESPONSE: Ecology will resolve this conflict in the technical guidance.

Page 7 Chapter 3 of Determination of Treatment and Source Control for UIC Wells in Washington State sixth bullet under Setbacks, delete the requirement for a setback from a Native Growth protection Easement. (Kitsap County Public Works)

RESPONSE: Ecology will consider whether the technical guidance needs to refer to Native Growth Protection Easements and will amend the guidance accordingly.

Page 7 Chapter 3 of Determination of Treatment and Source Control for UIC Wells in Washington State first bullet under Setbacks conflicts with DOE's SWM for WW, which requires 200 feet for setbacks from springs used for drinking water. (Kitsap County Public Works)

RESPONSE: Ecology will resolve this conflict in the technical guidance.

Page 7, bullets 1-2 & 7: The City of Richland is concerned about setback requirements from drinking water supplies and septic tank/drain field and the potential conflict with scheduled road improvement projects (e.g., road widening, etc.). As written, the setback requirements would prohibit jurisdictions from locating UIC wells (e.g., infiltration trenches with perforated pipes) within 100 feet of wells and drain fields on neighboring properties. These setbacks are not feasible for a large number of road improvement projects due space constrains (siting of UIC wells in established right-of-way), especially in areas with high numbers of on-site drinking water wells and septic tanks/drain fields. Ecology should provide some guidance to jurisdictions on this matter. Bullet 7 makes reference to setback criteria for ponds. This section should be updated to reflect requirements for sub-surface infiltration, as opposed to surface infiltration. (City of Richland/Yakima County)

Response: Ecology will be addressing this and other issues that have been brought to our attention during the comment period. After the UIC rule is finalized, we will hold further stakeholder meetings to work through issues that are still outstanding on the guidance document.

Page 8 Chapter 3 of Determination of Treatment and Source Control for UIC Wells in Washington State under Unstable soil, mentions improper placement of fill beneath a facility as being a potential stability problem. Siting of infiltration systems in fill soils is inappropriate. (Kitsap County Public Works)

Response: Ecology regulates UIC wells to prevent contamination of groundwater. The guidance does include recommendations to avoid slope stability problems; however the guidance is not meant to replace the judgment of a professional engineer or standard engineering best practices. Ecology will consider adding clarifying language.

Chapter 4 - Vertical Separation

Page 9: The separation of three feet from the base of UIC facilities used for stormwater management to the hardpan is too restrictive. Much of the Puget Sound region is underlain by hardpan that is 30 inches below ground surface. Soil infiltration is very important ecologically and hydrologically and is the preferred means of stormwater management in DOE's 2005 stormwater manual. A three-foot separation would preclude the use of this desirable stormwater management technique throughout much of Puget Sound. Given that DOE's 2005 stormwater manual requires stormwater treatment BMPs upstream of soil infiltration facilities, that these soil infiltration facilities only need to accommodate runoff from a six month storm and that the glacial till will provide an additional barrier to pollution of the confined aquifer, a separation of less than 3 feet should be adequate to prevent pollution of ground water resources. A sentence should be added to this section allowing UIC owners to demonstrate that a site-specific separation criteria less than 3 feet will be adequate to prevent ground water pollution. (City of Everett)

Page 10: Again, a sentence should be added to this section allowing drywell owners to demonstrate that a site-specific separation criteria less than 3 feet will be adequate to prevent ground water pollution. (City of Everett)

RESPONSE: Here is the relevant section of the guidance:

The base of all UIC facilities should be five feet above the seasonal high-water mark, bedrock (or hardpan) or other low permeability layer, except as noted below.

A separation down to three feet may be considered if the groundwater mounding analysis, the volumetric water holding capacity of the zone receiving the water, and the design of the overflow and/or bypass structures are judged by the design professional to be adequate to prevent overtopping and meet the site suitability criteria specified in this section.

The basic goal of the UIC program is to ensure discharges do not violate the ground water quality standards. In the rule and the guidance, there are two ways to approach this goal without having to obtain a permit: 1) The presumptive approach, and 2) the demonstrative approach. When the recommendations of either of these approaches are met, the UIC well may be rule-authorized and a state waste discharge permit is not required.

The presumptive approach calls for a minimum vertical separations specified in the guidance. The demonstrative approach allows for consideration of the situation you have mentioned.

See WAC 173-218-090 of the draft rule for stormwater UIC well basic requirements.

Ecology will consider adding language that clarifies the situation you have mentioned. We will be addressing this and other issues that have been brought to our attention during the comment period. After the UIC rule is finalized, we will hold further stakeholder meetings to work through issues that are still outstanding on the guidance document.

Page 9 Chapter 4 of Determination of Treatment and Source Control for UIC Wells in Washington State under Depth to bedrock, water table or impermeable layer, the first sentence states five feet above seasonal high water mark while page 24 of chapter 7 states a minimum of six feet between the bottom of the UIC and seasonal high water table. (Kitsap County Public Works)

The first paragraph states that the base of all UIC facilities (which would include infiltration drywells) should be five feet above the seasonal high-water mark, bedrock, or other low permeability layer. This separation requirement contradicts many later sections in the guidance document, especially Chapter 7 (Vadose Zone Treatment Capacity) and the tables contained within. The tables within Chapter 7 specify a minimum separation of six feet from the base of the UIC facility to the seasonal high groundwater table, provided the vadose zone is considered to have a high treatment capacity and will be used for treatment (or with pre-treatment) to meet the nonendangerment standard. The five-foot separation appears to be an artifact from the separation requirement for surface infiltration BMPs. The second paragraph allows a proposed separation down to three feet if a number of site-specific studies are conducted. Firstly, the cost to conduct such studies may preclude the use of such facilities, especially for facilities with a small number of proposed wells. Secondly, the separation down to three feet contradicts the separation requirements reference above and may be an artifact of surface infiltration BMP requirements. (City of Richland/Yakima County)

"Five feet" of separation should be changed to read "six feet" (see previous comment). (City of Richland/Yakima County)

The draft WAC requires new Class V wells to meet separation between the bottom of the well to the top of the aquifer based on the Stormwater Management Manual for Eastern Washington, 2004. Page 5-53 has as little as three feet of high-capacity treatment matrix thickness above vadose zone if reliable on-site information is available. This wording isn't in the Draft Determination of Treatment and Source Control for UIC Wells in Washington State, July 2005. Does this present a conflict in the WAC which refers to the Eastern Washington Manual and technical manuals approved by the de department? (Thurston County, Rancour)

RESPONSE: The draft guidance refers to vertical separation in two ways. One is to prevent UIC discharge directly into aquifers. The minimum separation is five feet, with exceptions (see Chapter 4, page 9 of the draft guidance.)

The other is to provide a minimum amount of vadose zone material capable of treating a narrowly defined class of contaminants (solids, metals, oils). The minimum separation in table 1 (Chapter 7, page 28) is six feet of the specified types of materials.

The same stratigraphy can be used to meet the two vertical separation requirements.

These comments indicate that there is confusion over the minimum vertical separation. Ecology will look at adding clarifying language to resolve this confusion.

The technical guidance now being revised supercedes the UIC section in the Stormwater Management Manual for Eastern Washington. References to the Stormwater Management Manual for Eastern Washington have been removed from the rule.

Chapter 4 - Filter Fabric

Page 10, Design criteria for Infiltration Drywells (Second bullet): Filter fabric should not be placed on the drywell sides as it leads to plugging and maintenance problems. (City of Spokane Valley)

RESPONSE: Ecology will be addressing this and other issues that have been brought to our attention during the comment period. After the UIC rule is finalized, we will hold further stakeholder meetings to work through issues that are still outstanding on the guidance document.

Chapter 4 - Slope Stability

Page 10, Fourth bullet: "Drywells should not be built on slopes greater than 25 percent (4:1) without evaluation by a professional engineer with geotechnical expertise or qualified geologist and jurisdiction approval. (WA State Department of Transportation)

RESPONSE: This suggestion has merit. Ecology will be addressing this and other issues that have been brought to our attention during the comment period. After the UIC rule is finalized, we will hold further stakeholder meetings to work through issues that are still outstanding on the guidance document.

Chapter 5 - Operation and Maintenance
Page 11: Cleaning a drywell on a semi-annual basis is not reasonable for owners of several thousand drywells. (City of Spokane Valley) Page 11: Chapter 5, Maintenance Criteria for Drywells, is overly prescriptive based on the requirements of 40CFR144.12(a), I suggest the following words: Maintenance of a UIC well should be of a frequency and manner to ensure that the well maintains a "nonendangerment" status. Maintain any pre-treatment facility according to the requirements for that particular BMP. (Energy Northwest) ***RESPONSE: Ecology will consider changes to the language regarding the maintenance period for clarification.***
Page 11: Any Operation and Maintenance guidance on monitoring the performance of the wells? (USGS) ***RESPONSE: The current draft guidance does not contain language on performance monitoring. However, after the UIC rule is finalized, we will hold further stakeholder meetings to work through issues that are still outstanding on the guidance document.***
Chapter 7 - Spill Control
Page 15: Requiring containment structures and a spill prevention control and containment plan merely because an area meets the definition of a high vehicle traffic area seems to miss the mark. We feel that it is far more appropriate to apply the risk factors presented in the section Evaluating the Need for Spill Containment Structures or Control Devices for Other Situations rather than high vehicle traffic area triggers requiring oil control treatment BMPs. (WA State Department of Transportation) ***RESPONSE: There are two issues addressed in this comment: 1) Spill control in high vehicle traffic areas, and 2) When pretreatment for oil is needed.*** ***The guidance addresses spill control in high vehicle traffic areas separately from other situations because the response time to a spill would be longer compared to a facility with personnel on site.*** ***Oil control is a separate issue from spill control. Due to concentrations of oil from high-use roadways, the non-endangerment standard is not expected to be met without some pre-treatment for oil. An oil control BMP is required when the vadose zone is used as a treatment layer and the pollutant loading category is high in Table 3 of the guidance.*** ***We would be happy to discuss your concerns further in the stakeholder meetings that will be held to discuss outstanding issues with the guidance.***
Page 17: Bullet 3, as written, requires a minimum of 15 feet of separation between the bottom of the drywell and the top of the unconfined aquifer, if the vadose zone is to be used to temporarily contain spills. Please cite the source of this separation requirement. (City of Richland/Yakima County)

RESPONSE: Ecology will remove this section. The vadose zone should not be used for spill containment.

Chapter 7 – Presumptive Approach and Ground Water Standards

Page 17: The pre-treatment section states that BMPs chosen "…must remove or attenuate the target pollutants to levels that will comply with state groundwater quality standards…". You can't have both a presumptive standard and a performance standard. This statement conflicts with the presumptive approach taken in the rule and should be eliminated. (King County Water and Land Resources Division)

RESPONSE: If an owner/operator follows Ecology's stormwater manuals and technical guidance for discharges into a UIC well it will be presumed that the discharge is complying with the state groundwater standards unless there is site specific information which indicates that the presumption is incorrect and then monitoring may be necessary. Monitoring is not required unless a ground water problem exists or past practices are determined to be considered a high pollutant load category which could lead to groundwater quality problem.

Chapter 7 – Pre-Treatment - UIC Wells Adjacent to Impaired (303d) Waters

One thing that stands out in the guidance is the inclusion of additional requirements of the UIC well when adjacent to surface waters where Total Maximum Daily Load (TMDL) criteria for metals, pathogens, and phosphorous have been determined. It is unclear what authority Ecology has under the Safe Drinking Water Act, and thus UIC wells, to regulate non-drinking waters and surface waters. It is assumed that non-drinking waters and surface waters are regulated under the Clean Water Act and National Pollutant Discharge Elimination System permit. Please provide information regarding Ecology's authority to regulate non-drinking water under the UIC well program. (Thurston County, Bachmeier)

Page 21: Metals Removal – "UIC wells located less than 100' from a surface water body that is impaired due to metals must use additional pre-treatment for metal removal when the UIC well…" It is unclear in this section about the installation of additional pretreatment. Does this entail retrofitting existing wells or apply to the construction of new wells, will wells need to be retrofitted when a water body is placed on the 303(d) list and will Ecology notify the owners of the need to retrofit? This belongs to the 303(d) program and TMDLs not to the UIC program. (King County Water and Land Resources Division)

RESPONSE: References to 303d listed waters and TMDLs are an advisory that UIC wells may be considered sources of impairment to streams when they are hydraulically connected. "Hydraulically connected wells" means wells whose ground waters have been shown to be hydraulically connected to surface waters.

Ecology has the authority under RCW 90.48 to regulate the waters of the state, including both surface water and ground water:

The technical guidance applies to new stormwater UIC wells. Retrofitting would not be an issue unless a water quality problem has been identified for a particular well or retrofit is identified as a necessary action in a TMDL or other water quality clean-up plan.

Chapter 7 – Pre-Treatment - Treatment Requirements near Drinking Water Wells

Page 18: Pathogens: basic treatment requirements extends to up 1,000 feet (or ~0.2 miles) from a drinking water well when the vadose zone is categorized as low or none. This should be evaluated in a case by case basis and take into account the vertical hydraulic conductivity of the aquifer, not just the distance to the well. (City of Spokane Valley)

RESPONSE: This requirement provides general protection for drinking water wells where the vertical and horizontal conductivities of aquifers have not been established. We are making a conservative assumption to protect drinking water supplies from pathogens where little or no protection is provided by the vadose zone. Local government may establish a ground water protection area such as a wellhead protection zone and may require additional protection of the ground water supply. The guidance directs UIC owners to follow local regulations. In this way, the hydraulic conductivity of aquifers may be taken into account. Ecology is not requiring a case-by-case analyses of aquifer properties for rule-authorized UIC wells. UIC wells that require a permit may have additional requirements.

Chapter 7 – Pre-Treatment - Intensively Managed Landscapes

Page 19: I'm Brenda Sims, Spokane County Stormwater Utility Manager, 1026 West Broadway, Spokane, 99260, and I want to make, today, just one comment regarding the document that's entitled "Determination of Treatment and Source Control for UIC Wells in Washington State Draft", and it's dated July, 2005, and my comment relates to page 19, the section that talks about intensively managed landscapes. Basically, this guidance suggests that runoff from intensively landscaped areas such as golf courses, public ball fields, and cemeteries, need to be directed to bioinfiltration, or biofiltration systems, or to constructed wetlands prior to discharge to UIC wells. I'm not – I don't have an issue with the philosophy and the thought behind this, but my concern relates to the fact that most local jurisdictions, when we size our stormwater facilities to provide treatment, we do not include, in the sizing of those facilities, the pollution generating pervious surfaces, and this seems to be indicating that we need to at least look at that. One problem with sizing our treatment facilities for such pervious surfaces, is that, certainly in Spokane County and most of the areas that have dry wells or underground injection control systems for stormwater, this intensive management of a landscape is very, very seasonal. It's only occurring during the summer time, which is traditionally our dry period, though we do have some thunderstorm events. I think, perhaps, the interpretation of the guidance can be left fairly flexible, and that's what I'm hoping Ecology will do, because as long as we would direct the runoff to either a biofiltration or bioinfiltration system or constructed wetlands, perhaps we could get by with doing that without actually sizing those facilities specifically to include those pervious, pollution generating pervious surfaces. (Spokane County)

RESPONSE: Ecology does not intend to change the stormwater pond sizing requirements through the UIC guidance. Please refer to the Stormwater Manual for Eastern Washington. We would be happy to discuss this further if needed.

Chapter 7 – Table 2: Pollutant Loading Classifications for Solids, Metals, and Oil in

Stormwater Runoff Directed to UIC Wells

Page 29: What is the science basis for the Average Daily Traffic (ADT) numbers used in Table 2 of the Draft Determination of Treatment and source Control for UIC Wells in Washington State? (Thurston County, Rancour)

Page 29: There also seems to be a large ADT difference between highways with some access control and no access control. What is the science that justifies this difference? (Thurston County, Rancour)

Page 30: Overall, it appears that pre-treatment is recommended for underground injection of contaminated water. Are there technical references to support the table or is it "best professional judgment?" (USGS)

RESPONSE: The justification for the Average Daily Traffic (ADT) numbers used in Table 2 is described in the Discussion Paper entitled Establishment of an Annual Average Daily Traffic Threshold for Applying Enhanced Treatment (Dissolved Metals Removal) March 2005. This document may be viewed at: *http://www.ecy.wa.gov/programs/wq/stormwater/WW%20Stormwater%20Manual/Draft%20Discussion%20Paper%20_ADT%20Threashold_.pdf.*

Page 29: Most of our UIC wells are on very low volume local access roads where there is no application of sand or deicing compounds. Can the "insignificant" classification contain some local low volume roads or can some of them be exempt from the inventory like UIC wells for homes? It seems like we are creating a lot of work that may not be justified. (Thurston County, Rancour)

RESPONSE: There is no provision for exempting non-residential UIC wells from the inventory requirement, so UIC wells on very low volume local access roads must be registered.

Local low volume roads are classified as having low pollutant loading potential in table 2, and therefore do not require pretreatment, except for solids removal where the ground has no treatment potential as defined by table 1 (materials like gravel, cobbles, boulders and fractured bedrock).

Also, the guidance allows exceptions to tables 1 through 3 based on site-specific or local studies, including allowing for changes in the pollutant loading categories in table 2 based on source control activities. The local alternative method must meet the non-endangerment standard based on local conditions. See page 26 of the guidance.

Chapter 7 – Table 3: Pre-treatment required for Solids, Oil and Metals

Page 29: Like with all guidance limits, there can be some seemingly severe thresholds. For instance there could be a local access road with only a few cars traveling it per day (very low end of the pollutant loading classification) but not meet the distance to ground water by a very small limit. Would this require a permit? Is there any authority of DOE to grant an exception? (Thurston County, Rancour)

RESPONSE: The tables actually aren't referring to the distance to ground water. They are referring to the thickness of vadose zone material available to act as a treatment layer. The categories depend both on the thickness and type of vadose zone material.

Ecology realizes that there may be confusion over how to apply table 1. We will work on adding clarifying language and examples.

At most, the example you bring up would require solids removal prior to discharge and wouldn't be subject to a permit.

The Department of Ecology makes the decision that a UIC well is either rule-authorized or needs a permit based on whether the UIC well meets the non-endangerment standard.

The non-endangerment standard may be met either by following the guidance, or by demonstration to the department that the UIC will meet the standard. See page 4 of the draft guidance for more information.

Page 30: WAC 173-218-090 (2) requires retrofitting existing UICs that have a "high threat to ground water". Determination of Treatment and Source Control for UIC Wells in Washington State does not explicitly state what combination of soil treatment capacity and pollutant loading (table 3) constitutes a high threat to ground water. Recommend placing a footnote on any combinations that would constitute a high risk to ground water without pre treatment. (Kitsap County Public Works)

RESPONSE: Adding footnotes to table three indicating possible "high threat to ground water" scenarios is a good idea and Ecology will consider adding them. The guidance was written to be applied to new wells but it could be used by owners of existing wells to help determine if their UIC wells pose a high threat to ground water. One possible example of a high threat to ground water scenario from table 3, would be a site located over a vadose zone with no treatment capacity (none) and the pollutant load to the well was determined to be a high pollutant loading category. Ecology will be addressing this and other issues that have been brought to our attention at future stakeholder meetings. Ecology will also be drafting an administrative guidance that will include information on completing a well assessment for existing wells.

Page 30: Given the expense and difficulties of remediating contaminated subsurface soils and ground water, and given the potential for pesticides and elevated nutrients in runoff from less intensively managed landscapes (such as suburban lawns), my judgment would lean towards solids removal pretreatment for all but insignificant pollutant loadings. (USGS)

RESPONSE: Tables 1 – 3 apply to stormwater runoff from roads that contain solids, metals or oils only. Stormwater runoff that contains pesticides and elevated nutrients requires pretreatment prior to discharge to UIC wells. In the cases where pretreatment is not effective, source control must be used to prevent contamination of stormwater runoff by pesticides and nutrients. See pages 18 and 19 of the draft guidance.

Pages 28-30: Please cite the sources used to prepare Tables 1-3. (City of Richland/Yakima County)

Page 30: Overall, it appears that pre-treatment is recommended for underground injection of contaminated water. Are there technical references to support the table or is it "best professional judgment?" (USGS)

RESPONSE: This is guidance for an UIC well owner and Ecology to determine if a UIC well used for stormwater management can be rule-authorized. UIC wells that are not rule-authorized must be covered by a permit. The tables specify when pretreatment is required to remove contaminants before injection in order for a UIC well to be rule-authorized.

According to a review of the literature, numerous contaminants commonly seen in stormwater may occur at concentrations that exceed drinking water standards. See various citations in the guidance and the additional reference below. The vadose zone can provide some removal, primarily by filtration and adsorption, but in many cases this removal is not sufficient to meet standards. This is why Table 3 outlines what pretreatment is required for various combinations of pollutant loading and vadose zone conditions.

The tables are based on both technical information and best professional judgment used to review that information. Participants in the development of the guidance included professional engineers, hydrogeologists, and stormwater managers. Challenges in this process included some differences of opinion along with how to address the wide variation in land uses and hydrogeologic settings across the state.

Ecology believes that the approach used is reasonable and generally protective of water quality. However, the UIC well owner is ultimately responsible for making sure the discharge does not contaminate.

The justification for the Average Daily Traffic (ADT) numbers used in Table 2 is described in the Discussion Paper entitled Establishment of an Annual Average Daily Traffic Threshold for Applying Enhanced Treatment (Dissolved Metals Removal) March 2005. This document may be viewed at http://www.ecy.wa.gov/programs/wq/stormwater/WW%20Stormwater%20Manual/Draft%20Discussion%20Paper%20_ADT%20Threashold_.pdf.

Section III - Add More Information

Ecology received many helpful suggestions for adding citations, examples, and information. These suggestions are much appreciated and will be addressed in the draft guidance.

Chapter 1 - Introduction

Page 1: Stormwater can also be managed on site by collecting it in a retention basin/pond and allowing it to evaporate. This alternative is more suitable for the eastside of the state. (City of Richland/Yakima County)

RESPONSE: Ecology will add a reference to managing stormwater by evaporation.

Page 2: Application and Limitations – Definition of UIC Well (pg 2, paragraph 1) – Please cite the reference that defines UIC facilities (e.g., WAC 173-218). (Yakima County)

RESPONSE: Ecology will add this reference.

Page 2: How to Use this Document: We assume that this entire section will be removed once incorporated into the appropriate manuals. If this section will remain, we suggest combining the two paragraphs and inserting as a disclaimer at the beginning of the document. (City of Richland/Yakima County)

Response: Ecology has taken note of this comment.
Page 2: Sub-section "The following are not UIC wells," last sentence – Suggest adding the following text: ". . . according to the specifications of the Department of Ecology stormwater management manuals or other manuals approved by the Department of Ecology, they do not have to meet . . . ." (WA State Department of Transportation) ***RESPONSE: Ecology will look at adding appropriate references to other approved manuals.***
Page 3, first sentence: Suggest adding the following text: "UIC wells may be used for overflow from a stormwater facility that is greater than the runoff treatment design storm without further treatment." (WA State Department of Transportation) ***RESPONSE: UIC wells are allowed for overflow in the E WA stormwater manual. The facility must be built to the design storm specification of an approved manual and then the UIC can be used for overflow. Ecology will consider adding "runoff treatment" before "design storm."***
Chapters 2
Page 7 Chapter 2 of Determination of Treatment and Source Control for UIC Wells in Washington State "Setbacks" the sixth bullet refers to ponds. Ponds are not UICs. Recommend substituting UICs for ponds in the first sentence. (Kitsap County Public Works) ***RESPONSE: Ecology agrees with this suggestion.***
Chapter 3
Chapters 3 and 4 should have an introductory statement clarifying that these requirements apply to New UIC wells. (Energy Northwest) ***RESPONSE: Ecology agrees with this suggestion.***
Chapter 4
Page 9: "Soil infiltration rate and drawdown time". Portions of this section are confusing as presently written. The use of the term "water quality design storm" in the first and last sentences in this section is inconsistent with terminology "runoff treatment" that is currently in used in Ecology's storm water management manuals. In addition, the typical stormwater UIC wells have a water quality treatment BMP in place prior to discharging in the UIC well unless the UIC well meets the pollution and vadose zone treatment requirements. If this is the case, then fifth paragraph should reflect this. Also, stormwater UIC wells are usually designed to accommodate the larger "flow control", flooding, or other large event designated by the local jurisdiction not the "runoff treatment" event. Suggest amending the text in this section as follows: "The water quality design runoff treatment storm volume is the amount of runoff predicted from the 6-month, 24-hour storm. The purpose of the flow control "design storm" is to design a facility that accommodates the runoff

expected from a typical large storm event. The amount of time it takes for water to drain out of a UIC well depends on how fast the soil allows water to infiltrate and how much water the UIC well holds. The soil infiltration rate is the amount of water that infiltrates into the ground in a specified amount of time, usually in inches per hour. The drawdown time is the amount of time it takes for water to drain out of the UIC well, and depends on the construction of the well and the infiltration rate. In most cases, facilities are designed to completely drain ponded runoff from the flow control design storm within 48 to 72 hours after flow to the UIC facility has stopped. If the UIC facility is designed to meet a runoff treatment requirement by meeting the pollution loading and vadose zone treatment capability requirements, the long-term infiltration rate, as determined under the worst-case scenario, must be sufficient to accommodate the water quality runoff treatment design storm identified in the Department of Ecology stormwater management manual or other manuals approved by the Department of Ecology for the site location." (WA State Department of Transportation)

RESPONSE: Ecology appreciates these suggestions and will consider incorporating them into the guidance.

Chapter 4 – Design and Construction

Page 10: Last sentence of the first paragraph: "They may be used as stand-alone structures, or as part of a larger drainage system, such as the overflow for a bio-infiltration swale or other stormwater treatment BMP." (WA State Department of Transportation)

RESPONSE: Ecology appreciates this suggestion and will consider incorporating it into the guidance.

Chapter 6 – Potential Contaminants in Stormwater Runoff

Page 11: In general, this chapter states that urban areas and roads contribute to stormwater contamination, but fails to provide the reader with the necessary technical data and information or citations to backup such a statement. As an example, suggest citing some expected/ measured reductions in total metal concentration as a result of filtration and settling, and provide expected/measured concentration of the remaining dissolved fraction. Provide for comparison, applicable groundwater quality standards (state or other applicable federal standards or guidelines) for metals, coliform bacteria, pesticides, nutrients, and other potential contaminants in stormwater runoff. (City of Richland/Yakima County)

RESPONSE: The guidance does cite some references (see page 22, Vadose Zone Treatment Capacity). In addition, the justification for the Average Daily Traffic (ADT) numbers used in Table 2 is described in the Discussion Paper entitled Establishment of an Annual Average Daily Traffic Threshold for Applying Enhanced Treatment (Dissolved Metals Removal) March 2005. This document may be viewed at http://www.ecy.wa.gov/programs/wq/stormwater/WW%20Stormwater%20Manual/Draft%20Discussion%20Paper%20_ADT%20Threashold_.pdf.

We will consider adding more examples, references, or information along the lines you have suggested.

Page 12: Bullet 5 states that pesticides (and nitrates) are very difficult to remove from

stormwater. Many pesticides, depending on their sorptive characteristics (affinity for soil organic material), may be adequately removed from stormwater runoff through the use of "basic treatment" techniques (e.g., sand filtration or other technologies aimed at removing suspended solids). It may be more appropriate to state that water-soluble pesticides (those having lower Kow values) in urban area stormwater runoff can be more difficult to remove. (City of Richland/Yakima County)

RESPONSE: Ecology appreciates this comment and will consider adding the appropriate information to the guidance.

Page 14: This section should indicate that Ecology will accept Source Control BMPs found in other approved manuals such as those found in the Regional Road Maintenance Endangered Species Act Program Guidelines — Regional Guidelines. (King County Water and Land Resources Division)

RESPONSE: The UIC rule states that local approved stormwater manuals that are equivalent to the most current Ecology manual can be used. The demonstrative approach could be another way to show that bmps in other manuals are protective of ground water quality.

Chapter 7 - Spill Containment and Control

Page 14: Suggest that a contact number (working and after hours) be provided for all spills that must be reported to Ecology. (City of Richland/Yakima County)

RESPONSE: Ecology will include a contact number for spills in the guidance.

Page 15: Need to define what constitutes a "spill containment structure" (i.e., design, containment volume, etc.)? (WA State Department of Transportation)

Page 15: Spill containment structures for High vehicle traffic areas. Need to clarify what it is required here? Is a catch basin with a sump a spill containment structure? Coalescing Plate Separators or API Separators require significant area under the road and may lead to safety concerns when maintaining. (City of Spokane Valley)

Page 15: Suggest adding a definition (along with some examples for unfamiliar readers) for spill containment structures and spill control devices to the Glossary at the end of the document. (City of Richland/Yakima County)

RESPONSE: Ecology will consider adding language to clarify what is meant by "Spill containment structures" and "spill control devices."

Page 15: References are made to criteria for traffic, commercial, industrial, and other specific areas (e.g., fueling stations, petroleum product storage areas, etc.). Please cite the source of these criteria. (City of Richland/Yakima County)

Page 16: Please cite the source of these criteria (see previous comment). (City of Richland/Yakima County)

RESPONSE: The sources for these criteria are the Stormwater Management Manual for Eastern Washington and the 2005 Stormwater Management Manual for Western Washington.

Page 16: Fueling stations and facilities are listed as requiring spill control devices. However, this same general category is required to have a spill containment structure under the previous

section, Spill Containment Structures. Is the intention to require both the structure and the device? If so, please indicate. (City of Richland/Yakima County)

RESPONSE: Ecology does not intend to require both a spill containment structure and a spill control device, and we will reconcile this inconsistency.

Chapter 7 - Preserving Infiltration

Page 18: This section would also pertain to the use of UIC wells for flow-control protection of streams in eastern Washington. Reference should also be made to the Stormwater Management Manual for Eastern Washington. (City of Richland/Yakima County)

RESPONSE: Ecology will make appropriate changes.

Chapter 7 - Pre-Treatment

Page 18: Municipalities will be required under the NPDES Phase II Municipal Stormwater General permit to address failing septic systems, improperly connected sewer lines, and to provide education to target audiences. Suggest adding appropriate language to make a connection between the requirements of municipalities in this document and those under the permit. (City of Richland/Yakima County)

RESPONSE: Ecology will take this idea into consideration.

Page 19, “Sites Generating High Nutrient Loads”. Need to more clearly define what constitutes a “high nutrient load-generating site”. (WA State Department of Transportation)

RESPONSE: We can see where there could be confusion on this page since “intensely managed landscapes” is also an example of a “site generating high nutrient loads.” Ecology will clarify this information and will include examples. Examples from the Ecology stormwater manual include commercial composting, commercial animal handling areas and nurseries.

Page 19, “Intensely Managed Landscapes”. First sentence. The use of the term “heavily applied” should be defined. Second paragraph. Suggest adding the following text: “Runoff from these types of landscaped areas should be directed to biofiltration or bioinfiltration systems, or to constructed wetlands prior to discharge to UIC wells.” (WA State Department of Transportation)

RESPONSE: The term “heavily applied” would be related to whether or not a discharge from the land surface would carry nutrients or pesticides in the runoff that would violate ground water quality standards if the discharge was to a UIC well. We will discuss this issue in a stakeholder meeting if needed.

Ecology will consider making the change in the second sentence as you have suggested.

Page 19: Under the bolded heading, Intensely Managed Landscape, it is stated “Treatment is ineffective in removing these pollutants (i.e., pesticides and fertilizers) from runoff”. The term “treatment” should be defined or examples provided. As stated previously, “Basic Treatment” may be suitable for pesticides that are less water-soluble. (City of Richland/Yakima County)

Page 19: The second sentence in the first paragraph is confusing. It states that treatment is ineffective at removing nutrients from runoff, yet the second paragraph recommends use of three treatment systems. It appears that “treatment” in this sentence should be replaced by

"infiltration." (City of Everett) ***RESPONSE: Perhaps we should say "non-biological" treatment systems, such as catch basins, are ineffective at removing nutrients. Biological systems such as those listed are capable of removing nutrients.***
Page 21, "Oil Control", last sentence. Suggest adding the following text. See Ecology's stormwater management manuals or other manuals approved by the Department of Ecology for more information on these BMPs. (WA State Department of Transportation) ***RESPONSE: Ecology will consider adding the reference to the guidance.***
Chapter 7 – Vadose Zone Treatment Capacity
Page 22, "Vadose Zone Treatment Capacity ", fourth paragraph. Does "traffic areas with moderate to high use" refer to the ADT and other criteria listed in Table 2 under the "Medium and High Pollutant Loading Classifications"? If so the connection should be made, if not, need to provide a definition. (WA State Department of Transportation) ***RESPONSE: Thank you for the comment. Ecology will clarify the connection between this section and the tables.***
Page 22, fourth paragraph under Vadose Zone Treatment Capacity—It is correct to point out that soil cleanup activities could be called for after decommissioning a well. How would it be known if the subsurface soils are contaminated? If the State has additional guidelines for closing a UIC well, it would be useful to cite them on page 22. (USGS) ***RESPONSE: This guidance is geared toward new UIC wells used for stormwater management. Additional information on closing a UIC well will be included in an administrative guidance that will be completed after the UIC rule is finalized.***
Page 27, "Tables to Determine Pre-treatment Requirements for Solids, Metals and Oils", last sentence. This sentence should refer back to the "Oil control" section on page 21 where the distinction is drawn between those areas that need "oil separation" versus those that just need an "adsorptive capacity" BMP. (WA State Department of Transportation) ***RESPONSE: Ecology will add the reference to the guidance.***
Page 27: Also recommend giving a few examples of how the tables are to be used. This might include a scenario where a proposed UIC well is to be sited in a soil with a medium treatment capacity, but only seven feet of separation between the bottom of the UIC well and the seasonal high groundwater level, and in an area with a medium pollutant loading classification. In this case, one would turn to Table 3 (page 30) and determine that a two-stage drywell would be required. However, because the minimum separation between the bottom of the UIC well and the seasonal high groundwater level is less than the allowable range of 10 to 24 feet, treatment for the removal of solids would be required. (City of Richland/Yakima County) ***RESPONSE: This is a very helpful suggestion. Ecology will add examples.***
Page, 28, "Table 1 ". How is "average grain size" determined? (WA State Department of Transportation) ***RESPONSE: Table 1 vadose zone material descriptions are based on a variety of ways that underground materials are typically described. Average grain size is typically based on sieve analysis where the percent passing is graphed against the grain size distribution.***

Page 30: Additionally, may want to add a note on those pollutant loading/treatment categories in Table 3 that will require spill containment structures (spill control devices are sufficiently addressed in note 1 for two-stage drywells at the bottom of Table 3). (City of Richland/Yakima County) ***RESPONSE: Ecology will review the tables with respect to recommendations for spill control devices. We will discuss this issue in a stakeholder meeting if needed.***
Section IV - Suggestions for Edits and Formatting
Ecology appreciates the following helpful editing and formatting suggestions. We will make the appropriate corrections.
Title— It would be useful to incorporate “Storm water” somewhere in the document title. (USGS) ***RESPONSE: Ecology agrees and plans to revise the title in the next draft..***
Chapter 1
Through this section (and many others) there is an inconsistent use of stormwater and storm water. Suggest the use of stormwater for consistency with other Ecology publications. (City of Richland/Yakima County) ***RESPONSE: Ecology will change "storm water" to "stormwater."***
Throughout this section (and the entire document as a whole) the use of numbered headings and sub-headings would provide a better flow to the document. The document, as currently formatted, is difficult to follow due to the overuse of bolded headings, sub-headings, and categories. The document should be formatted as the draft Construction Stormwater General Permit and the draft Phase II permit, as they should all compliment each other. (City of Richland/Yakima County) ***RESPONSE: Ecology will consider the comment.***
Page 1, first paragraph, last sentence. Suggest adding the following text: “In Washington, storm water is managed by natural dispersion, collecting the storm water . . . .” (WA State Department of Transportation) ***RESPONSE: Ecology will edit this sentence.***
Chapter 2
Page 3 Chapter 2 of the Determination of Treatment and Source Control for UIC Wells in Washington State; the first line of the second sentence states “The form is included in Appendix (xx)”. No form is attached to this document for public review. Recommend changing xx to the appropriate letter designator. (Kitsap County Public Works) ***RESPONSE: The additional appendices will be included in the final document.***

Page 4: Suggest adding ", and" after Registration and perhaps adding numbers in front of the two requirements. (City of Richland/Yakima County) ***RESPONSE: Ecology will consider the comment.***
Page 5: Suggest changing "the department" to "Ecology". (City of Richland/Yakima County) ***RESPONSE: Ecology will consider the comment.***
Page 7 Chapter 2 of Determination of Treatment and Source Control for UIC Wells in Washington State "Setbacks" refers to the uniform building code. This code is no longer used within the State of Washington. The international building code is the state building code. (Kitsap County Public Works) ***RESPONSE: Ecology will consider the comment and edit the language as needed.***
Chapter 4
Page 10, "Design Criteria for Infiltration Drywells". Suggest amending the text in this section as follows: Section Heading: "Design Criteria for Drywells". (WA State Department of Transportation) ***RESPONSE: Ecology will consider the comment.***
Chapter 6
Page 13: No reference is made to the table in Chapter 6. Suggest numbering all tables based on chapter number and sequential order (e.g., Table 6.1). (City of Richland/Yakima County) ***RESPONSE: Ecology will consider the comment.***
Chapter 7
Page 13: The July, 2005 guidance states that a well is presumed to meet the non-endangerment standard based on: 1. source control measures 2. pre-treatment 3. vadose zone treatment. These three items should be separated by "or". (King County Water and Land Resources Division) ***RESPONSE: Ecology will add "or."***
Page 14: Chapter 7 – Source Control (pg 14, paragraph 4, line 1) Replace "… contaminants must …" with "… contaminants should …". Also, add a comma after the text in the first two bullets and ", and/or" to the end of the text in the third bullet in this same paragraph. (Yakima County) ***RESPONSE: Agree with a change in the wording and additional punctuation.***
Page 15: Use consistent terminology or symbols (e.g., > or equal to or greater than) in this section (and throughout the document). (City of Richland/Yakima County) ***RESPONSE: Agree with the comment. Language will be changed for consistency.***
Page 17, "When a Spill Control Containment Structure or Control Device is Not Used". Are the bulleted items connected by "and" or "or"? (WA State Department of Transportation) ***RESPONSE: The bulleted items should be connected by "or". Language will be revised.***
Page 19: The bolded items under "The following land uses, conditions, and activities have special requirements" should be numbered to improve the flow of this section. (City of

Richland/Yakima County)

RESPONSE: Ecology will consider the comment.

Page 20: In paragraph 2, of the section entitled Tables to Determine Treatment Requirements, reference is made to sections 4.3.4 and 4.4.1. Not sure which document is referred to. Paragraph 5 of the same section makes reference to section 1.2.1. Not sure which document is referred to. In the section entitled Treatment Requirements, sub-section Industrial Roofs, reference is made to section 4.3.1. Not sure which document is referred to. Additionally, the last sentence in this section is incomplete. (City of Richland/Yakima County)

RESPONSE: Ecology will add language to clarify the reference.

Page 20, "Solids, Metals and Oil ". First paragraph. Suggest adding the following text: "Where adequate geologic and groundwater depth information are available, Tables 1 through 3 at the end of this chapter can be used to evaluate whether a stormwater discharge from a road, commercial, or residential site to a UIC well is presumed to meet the non-endangerment standard for solids, metals, oil, grease, and PAHs." Second and fifth paragraphs. Could not find the section number references use anywhere in the document. (WA State Department of Transportation)

RESPONSE: Ecology will add the term "road" and clarify the references in this section.

Page 21 Chapter 7 of Determination of Treatment and Source Control for UIC Wells in Washington State under Industrial roofs, references section 4.3.1 but does not indicate what manual the section 4.3.1 is located in. (Kitsap County Public Works)

RESPONSE: Ecology will clarify the references in this section.

Page 23, paragraph 3, currently reads "The ability of geologic material to filter or chemically alter pollutants such as solids, oils, and metals …". Suggest changing to read "… to filter or absorb pollutants …". Adsorption can include physical adsorption (London forces), chemisorptions (adsorption which results from chemical bond formation between the adsorbent and the adsorbate in a monolayer on the surface), or electrostatic adsorption (cation exchange), but in general these are all sorptive interactions that do not necessarily result in chemical alteration of the pollutant. (City of Richland/Yakima County)

RESPONSE: Ecology agrees with the comment. Language will be revised.

Page 24, paragraph 4, line 4, currently reads "These may be mixtures of materials where silt and clay fill the pore spaces …". Suggest changing to read" … void spaces …", since the silt and clay fill the area between the coarser soil materials. (City of Richland/Yakima County)

RESPONSE: Ecology will consider the comment.

Figure 1, on page 24 needs some labels (or fill patterns) to identify the various zones (e.g., material suitable and unsuitable for treatment, groundwater and highest known groundwater depth, etc.). Should keep in mind that most folks will not print the document using a color printer. (City of Richland/Yakima County)

RESPONSE: Ecology agrees with the comment. Labeling or patterns will be added.

Page 27, paragraph 3, line 1, currently reads "If the proposed UIC well does not meet the combined vadose zone treatment capacity and pollutant loading classification …". Suggest changing to read "… does not meet (1) the combined vadose zone treatment capacity and minimum thickness (separation) requirement and (2) the pollutant loading classification …".

(City of Richland/Yakima County) ***RESPONSE: Agree with comment. Language will be changed.***
Page 30: Table 4 – Page 30 is missing Note 4. (Yakima County) ***RESPONSE: Footnote 4 should be changed to footnote 2. Language will be revised.***
Page 30: Table 3 of Determination of Treatment and Source Control for UIC Wells in Washington State last column, row 3 has a footnote 4 symbol. There are only three footnotes associated with the table. Recommend replacing the 4 with a 2. (Kitsap County Public Works) ***RESPONSE: Language will be revised. Footnote 4 should be changed to footnote 2.***
Page 35: The definitions for the terms “Poorly-sorted” and “Well sorted” appear to be reversed. A “well-sorted” material has grains sizes that very in size fairly uniformly throughout the material while a “poorly-sorted” material has clumps of similar grain sizes with large gaps between them or only one size represented. See ASTM D 2487, Unified Soil Classification System. ((WA State Department of Transportation) ***RESPONSE: Ecology will consider the comment.***